

TWO NEW SPECIES OF PAPIRIUS.

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Papirius vittatus, n. sp.

Younger specimens dark purple above with pearly markings, lavender or lilac beneath; older ones maroon to almost black above, sides mottled with several shades of purple and brown. Head free, purple, with a broad, white transverse band across the front; oral region whitish; vertex with a distinct, white, sagittate mark from antennæ to prothorax; a black ocellus-like speck on the middle of the vertex; a few short bristles upon vertex and front; eyes dark, close behind antennæ upon a black patch narrowly surrounded by purple. Antennæ longer than the body, except in largest individuals, segments variable in relative length, but approximately in the ratio of 1:6:7:1.5 or 1:7:9:2; basal segments stout, as long as broad, brownish, with short, white bristles; second brownish at base, purple at middle, pearly apically, hairy distally; third purple, hairy, with obscure, whorled subsegments on apical half, broadening towards apex, penultimate subsegment swollen on one side; terminal segment purple, lanceolate in outline with five to seven distinct, whorled subsegments. Body ovate dorsally with a re-entering angle. Dorsum dark purple to blackish, with a pattern in pearly white, essentially as follows: On anterior half of dorsum a median longitudinal purple streak between two pearly streaks with dentate margins; behind these a squarish purple spot bounded by pearly and bisected by a short, median longitudinal, pearly streak; on either side, two short, irregular, pearly lobes extending obliquely forwards; next behind on the median line are one to three roundish purple spots broadly surrounded by pearly white; on posterior of abdomen a long, oblique pearly bar directed forwards from either side of the median line. Largest abdominal segment with a small, pale tubercle on either side of the middle. Dorsum naked anteriorly, with short white bristles posteriorly. Anal tubercle with bristles four times as long, and with a median longitudinal purple bar. Sides purple to blackish, with conspicuous hazel, chestnut and cinnamon mottlings. Thorax with a broad, lateral, longitudinal pearly band, sometimes replaced by one to four bright white spots. Sides of abdomen with two to five large, conspicuous, pure white spots, widely separated. Ventral surface lilac or lavender. Ventral filaments extensible to the length of the antennæ. Legs long, purple and yellow; tibia with broad alternate bands of dark violet and wax-yellow, white bristly. Claws

white; superior claw long, tapering, rather straight, six toothed; inner edge with two prominent teeth at about equal intervals; two more on both sides near the outer edge, dividing it into thirds; inferior claw half as long as the other, straight, tapering, bearing subapically a slender bristle longer than the claw, also a tooth upon a swelling on the inner edge near the base. Furcula almost reaching the head; manubrium stout, purple; dentes twice as long, slender, pale lilac, each with long white bristles on either side, and a single, extra long ventral, subapical bristle; mucrones white, less than one-third the dentes, narrowly elliptical, ventral concavity shallow, with distinctly serrate edges, apex clearly emarginate, having a median, rounded quadrate notch between two rounded teeth.

Maximum length, 3.3 mm. Described from over fifty specimens.

This species was found abundantly in February and March of this year, in a greenhouse at Cambridge, Mass., upon wet, decaying wood, and upon the outside of alga-coated flowerpots, especially in warm, moist and shaded situations.

P. vittatus is closely allied to *P. marmoratus*, Pack. I have examined the types of the latter species which have shrivelled and lost colour, yet show distinct, structural differences from *P. vittatus*, especially in the claws and mucrones. *P. marmoratus* has a longer, oblong mucro, not emarginate, but terminating in a distinct, rounded lobe; the distal spines of the dentes are clearly barbellate; claws shorter and stouter; the superior claw has four teeth much more obscure than the six of *vittatus*: an evident tooth on the middle of the inside, a second, obscure, midway towards the apex, and a pair of small lateral teeth near the outer edge, one-third from the apex; the inferior claw has a short, apical bristle, and is less dilated basally than in *P. vittatus*.

This species is easily recognized by the broad white head band, the sagittate mark, the three median dorsal streaks, and the brilliant white spots on the sides of the abdomen.

Papirius opalinus, n. sp.

General colour orange-rufous or ferruginous. Head, first two antennal segments, anal tubercle, and legs pale orange-ochraceous. Head with a few short bristles on front; vertex almost naked, swollen dorsally; eye spots black, often quadrate. Antennæ shorter than the body, from three-quarters to one-half as long, according to age; basal

segment twice as long as broad, naked; second three or four times as long, knotty, hairy towards apex; third purple, four or five times the basal, knotted, hairy except basally, obliquely dilated but squarely articulated at apex; terminal segment purple, half again the basal, lanceolate, moderately long, white, hairy. Body regular, elongate-oval in dorsal outline; anterior dorsum naked, translucent orange-ochraceous with a broad and long median shading of green due to chlorophyll in the stomach (lateral, convulsive movements of which are easily observable in living specimens); posterior dorsum and sides orange-rufous to dark ferruginous, often with a tinge of maroon, the general colour being due to the combined effect of minute orange-ochraceous and ferruginous mottlings; posterior dorsum with short white bristles upon minute, round, orange-ochraceous spots; anal tubercle hardly visible from above, bristly. Ventral surface pale yellow, with three pairs of smooth, buff-yellow tubercles: a small, rounded tubercle on either side the manubrium; a large, oval, oblique one either side the middle; a narrow, oblique pair anterior to these; ventral tube pale orange-ochraceous, transparent, buff-yellow inside at base; tube plus protruded filaments one-fourth longer than the antennæ. Legs slender; femur with sparse, short bristles; tibia paler distally, stout spiny at moderate intervals; claws white, very stout; superior claw of almost uniform width, little curved towards the mucronate apex, six toothed: inner edge with a tooth at the middle, and another midway between it and the apex; two pairs of lateral teeth, similarly placed near the outer edge; inferior claw two-thirds as long as the other, long triangular, tipped with a short bristle from a stout, straight midrib; inner edge sinuate or straight, with a short bristle one-third from base. Furcula short, reaching to ventral tube; manubrium extending beyond anal tubercle, sparsely hairy; dentes twice as long, stout, pale orange-rufous, with short, lateral bristles, and several longer, ventral bristles at regular intervals; mucrones white, one-fourth dentes in length, oblong, finely serrate beneath, apex rounded.

Maximum length, 1.6 mm. Described from over fifty specimens.

This species occurred abundantly with *P. vittatus* at the same time and place, feeding upon algæ on the outside of flowerpots, and, curiously, having the exact colour of the latter.

Types of the above species have been given to the Museum of Comparative Zoology at Cambridge, Mass.